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**Profiles of Strengths and Weaknesses of Task Force
Performance**

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13. ABSTRACT (Maximum 200 words) Military analysts extracted task ratings for NTC offense missions from take-home packages for nine AC and nine RC task forces. The ratings were aggregated to the level of critical combat functions (CCF). Both components had the same general pattern of strengths and weaknesses: CCFs with a high proportion of individual tasks related to planning and preparation were relative strengths; CCFs that require synchronization during execution were relative weaknesses. While AC units had consistently higher ratings, only five CCFs were dramatically different: Conduct intelligence planning, collect information, process information, disseminate intelligence, and mortars. CCF ratings for RC task forces were correlated with a METT-T index. The two Maneuver CCFs (Tactical movement and Engage enemy: direct fire and maneuver) had significant correlations. The authors conclude that the procedures provide useful data to support quantitative analysis and that the detail provided by the CCF level of aggregation allows a more useful analysis of training needs than a BOS level of aggregation.						
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PROFILES OF STRENGTHS
AND WEAKNESSES
OF TASK FORCE PERFORMANCE

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Profiles of Strengths and Weaknesses of Task Force Performance

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Profiles of Strengths and Weaknesses of Task Force Performance

Introduction

A rotation to a CTC provides units stressful, realistic training which clearly reveals the strengths and weaknesses of the unit during its rotation period. Through the Take-Home Package (THP), observer/controllers (OCs) provide a wealth of information on each unit's performance status. Unfortunately, however, the full benefits of the feedback information are not realized. At the unit level, brigade and battalion commanders typically move to other assignments before they design training to sustain strengths and correct weaknesses; and their replacements are frequently disinclined to work through previous THPs to extract the detailed evaluations they contain.

Even analysts who are highly motivated to extract information from THPs must spend much of their time structuring the information to make it accessible. For example, analysts who develop lessons learned from the POM archive about processes that lead to success must identify successful rotations and missions within the rotation for detailed study. Analysts who need to look at the relation between performance and modifications in training practices or resources must develop a baseline for comparison. Much of the information that is available in the THP is not suitable for quantitative analysis that considers several rotations.

The Profiles delivery order is increasing the accessibility of data in the THP by refining procedures to measure combat performance at the task force level. These measures will enable analysts to identify recurring weaknesses and exemplary procedures. Recent efforts sponsored by ARI-POM have demonstrated the feasibility of detailed evaluations of unit performance of tasks based on current feedback products. Allan, Root, and Lewman (1989) studied the relation of task performance to mission performance of four task forces (two each from a high and low performing brigade). Two sources of data were involved in that work:

- Task performance was based on the Battalion Battle Task Measurement System (BBTMS), where raters score specific tasks based on OC comments in the Lessons Learned sections of the THP.
- Mission performance was scored in terms of METT-T factors based on digital playback. The specific METT-T factors were terrain controlled, enemy forces killed, and friendly forces surviving.

The authors concluded that both sources of data (Battalion Battle Task Measurement System and METT-T) were viable and recommended that the methodologies be extended to larger samples.

Evans, Johnson, Creen, Ford, Henderson, and Huffman (1993) applied the BBTMS procedures for a set of Reserve Component (RC) and Active Component (AC) task forces. That set of analyses was organized around the seven battle operating systems (BOS).

The Profiles delivery order is extending the work of Evans, et al., to Critical Combat Functions (CCF). The CCF are 39 categories of performance required on the combined-arms battlefield. This structure is especially promising for performance evaluation because the CCFs strike a balance between overly-detailed tasks and overly aggregated BOS. A previous report (Ford and Creen, 1993) described the procedures to establish the relationship between battle tasks and CCFs. This report presents the results of converting the offense tasks to CCF, the pattern of strengths and weaknesses for RC and AC task forces, and the relation of CCF measures to an objective METT-T measure of battle results.

Approach

Sample

The sample for analysis focussed on offensive missions from nine RC rotations to NTC from FY 88-90. To provide a basis for interpreting the results, the sample was augmented by nine AC rotations from the same time. The distribution of rotations, with type of offense mission, is shown by FY in Table 1.

Table 1. Rotations and Mission Types in Sample

FY	Reserve Component					Active Component				
	Rot	D Atk	H Atk	C Atk	MTC	Rot	D Atk	H Atk	C Atk	MTC
86	2	6	0	1	2	1	3	0	0	1
87	2	4	3	0	1	2	5	0	0	3
88	1	3	1	1	0	2	3	2	1	2
89	2	6	0	0	4	2	4	2	1	3
90	2	4	2	2	1	2	5	1	2	1
Tot	9	23	6	4	8	9	20	5	4	10

Measures

Three measures were developed for the task forces:

- CCF measures for RC task forces
- CCF measures for AC task forces
- METT-T scores for RC task forces

CCF Measures for RC Task Forces. The CCF measures incorporated work performed under project Performance of National Guard and Active Units at the National Training Center. In that project analysts rated battalion battle tasks as Go, Borderline, or No-Go based on OC comments; tasks that were not addressed were not rated. In order for the ratings to be suitable for CCFs, 43 additional tasks had to be rated for each offense mission. The additional ratings reflected phases (plan, prepare, execute) and weapons systems (separate ratings for mortar and field artillery) and included some tasks that had been inadvertently omitted. Two analysts from the previous project rated the additional tasks independently, then discussed differences between their ratings, and, if they wished, revised their rating. Each rating was assigned a value of one (No-Go), two (Borderline), or three (Go). The numerical values for each task were then aggregated to the CCF level.

CCF Measures for AC Task Forces. The same procedure was followed for the AC task forces, except that only one analyst rated the tasks.

METT-T Scores for RC Task Forces. The METT-T score is an index of performance on each mission. The score has three elements:

- Enemy Forces--The proportion of enemy start strength that was destroyed at end of mission. This information was extracted from the battle damage assessment (BDA) table in the take-home package.
- Friendly Forces--The proportion of task force start strength that remained at end of mission. This information was also drawn from the BDA table.
- Terrain--Size of penetration of the objective as shown on the digital replay of each mission. The element is based on the number of combat systems reaching the objective.

Results

The primary purpose of the analysis of measures was to determine the profile of strengths and weaknesses of RC task forces by CCF. The profiles of AC task forces provided a basis for interpreting the results. The analysis of the relation between RC CCF performance and METT-T scores was intended to confirm whether the CCF ratings were consistent with more objective outcome measures.

RC Strengths and Weaknesses

Sixteen CCFs had scores from at least 30 offense missions by RC task forces. Performance in those CCFs is summarized in Table 2.

Table 2. Summary of RC CCF Performance

Critical Combat Function	Mean	S.D.	Msns
1. Conduct Intelligence Planning	1.61	.56	41
2. Collect Information	1.31	.49	41
3. Process Information	1.32	.53	41
4. Disseminate Intelligence	1.46	.64	39
5. Tactical Movement	1.52	.43	41
6. Engage Enemy: Direct Fire & Maneuver	1.21	.33	41
7. Mortars	1.29	.54	40
8. Field Artillery	1.19	.25	41
15. Fire Support Integration	1.26	.37	41
16. Active Air Defense Measures	2.02	.68	41
18. Plan for Combat Operations	1.57	.33	41
19. Direct & Lead: Prep. for Battle	1.35	.37	41
20. Direct & Lead: Execution of Battle	1.17	.30	41
21. Overcome Obstacles	1.51	.57	41
28. Transportation	1.54	.65	39
29. Supply	1.33	.35	41

Six CCFs were rated higher than 1.5. The highest rated CCF for RC task forces was CCF 16 (Active Air Defense Measures). The high rating on this CCF may be misleading for two reasons. First, close air support was not well incorporated into the scenarios during the period of the subject rotations. Second, at least some of the air defense elements appear to have been from the active component. The other "higher rated" CCFs related to planning (CCF 1--Intelligence Planning, and 18--Plan for Combat Operations) and movement without enemy contact (CCF 28--Transportation, 5--Tactical Movement, and 21--Overcome Obstacles). These CCFs have a high proportion of tasks by individual commanders or staff members, for example (from Intelligence Planning):

- Develop recon and surveillance plan (1.85)
- Analyze terrain (1.77)
- Prepare intelligence estimate (1.73)

The line for "lower rated" CCFs was set at 1.3. These CCFs included all functions related to fire support (CCF 7--Mortars, 8-- Field Artillery, and 15--Fire Support Integration). The other low rated CCFs involved contact with the enemy: CCF 6--Engage Enemy with Direct Fire and Maneuver, and 20--Direct and Lead Unit During Execution of the Battle. These CCFs tend to emphasize synchronizing combat power, especially indirect fire. The lowest rated tasks from the lowest rated CCF (20: Direct and Lead Unit During Execution of the Battle) illustrate the persistent weaknesses with synchronization:

- Control supporting fires (1.10)
- Maintain contact with adjacent units (1.11)
- Comply with commander's intent (1.12)
- Control supporting units (1.13)
- Control task force movement (1.13)
- Maintain communication (1.17)

AC Strengths and Weaknesses

The performance of active component task forces on the CCFs covered by the battle tasks is shown in Table 3.

Table 3. CCF Performance By AC Task Forces

Critical Combat Function	Mean	S.D.	Msns
1. Conduct Intelligence Planning	1.95	.63	39
2. Collect Information	1.92	.70	39
3. Process Information	1.70	.74	38
4. Disseminate Intelligence	2.11	.82	35
5. Tactical Movement	1.62	.50	39
6. Engage Enemy: Direct Fire & Maneuver	1.35	.52	39
7. Mortars	1.89	.73	38
8. Field Artillery	1.30	.57	39
15. Fire Support Integration	1.41	.48	39
16. Active Air Defense Measures	2.05	.75	39
18. Plan for Combat Operations	1.81	.34	39
19. Direct & Lead: Prep. for Battle	1.69	.60	39
20. Direct & Lead: Execution of Battle	1.36	.39	39
21. Overcome Obstacles	1.44	.68	39
28. Transportation	1.65	.85	34
29. Supply	1.63	.74	39

The patterns of strengths and weaknesses for the two types of task forces are shown in Figure 1. That figure shows the CCFs in order of AC strength. While active component units showed consistently higher levels of performance, the differences were rarely dramatic. With only a few exceptions, the pattern of strengths and weaknesses are the same regardless of the type of unit: CCFs with a high proportion of individual tasks related to planning and preparation (such as intelligence planning and dissemination) are relative strengths; CCFs that require synchronization during execution (such as field artillery and leading the unit during execution) are relative weaknesses.

Profiles of CCF Performance

Offense

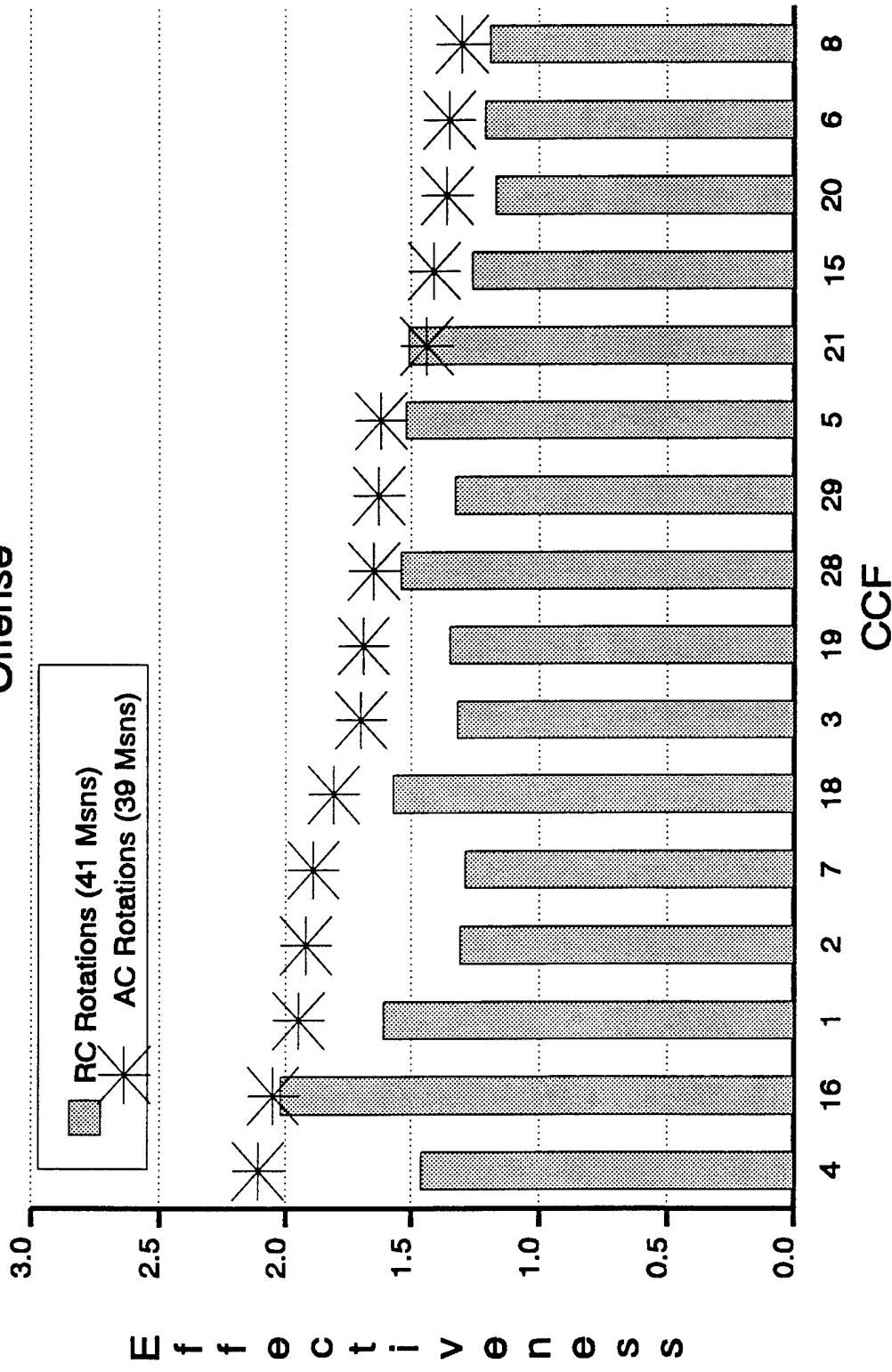


Figure 1: CCF profiles for AC and RC Task Forces

Five CCFs show exceptional advantages in AC performance. Four of those CCFs (1, 2, 3, and 4) relate to intelligence products; the other exception is CCF 7 (Mortars). The tasks related to the CCFs where AC units were exceptionally higher than RC units are shown in Table 4. The number of RC ratings reflects both raters.

Table 4. Task Ratings in CCF 1, 2, 3, 4, and 7

Battle Task	AC Mn	AC #	RC Mn	RC #
CCF 1: Conduct Intel Planning				
29. Establish reporting criteria	2.33	9	1.50	12
28. Develop R & S plan	2.17	29	1.85	74
19. Prepare intel estimate	2.11	38	1.73	78
10. Analyze terrain	2.06	34	1.77	70
167. Conduct IPB process	1.86	36	1.36	70
73. Verify IPB product (plan)	1.61	36	1.45	65
33. Update R & S plan	1.20	5	1.14	36
9. Conduct leader's recon	NR	0	1.75	4
CCF 2: Collect Information				
171. Report combat information	2.29	14	1.55	38
169. Direct intel collection	2.23	13	1.32	34
80. Conduct R & S (during prep)	2.00	34	1.40	77
130. Conduct R & S (during exec)	1.89	38	1.24	76
102. Verify IPB product (prep)	1.74	35	1.20	60
CCF 3: Process Information				
168. Analyze combat information	1.90	31	1.41	68
140. Verify IPB product (exec)	1.61	38	1.26	81
CCF 4: Disseminate Information				
170. Dissem. intel and combat info	2.50	16	1.47	34
124. Conduct battlefield update	2.06	34	1.47	72
CCF 7: Mortars				
92M. Posit fire spt forces (mtr)	2.58	24	1.78	46
152M. Reposition FS forces (mtr)	2.14	21	1.47	55
107M. Dissem fire spt plan (mtr)	2.00	1	1.15	26
141M. Execute fire spt plan (mtr)	1.83	36	1.18	74
153M. Integ FS w/ scheme of mnvr (mtr)	1.82	3	1.14	70
100M. Rehearse FS plan (mtr)	1.50	6	1.00	14
132M. Use screening fire (mtr)	1.41	17	1.13	46
108M. Supv. FS prep (mtr)	1.00	1	1.22	37

The contrast between performance on the tasks in Table 4 are generally consistent with expectations of the benefits of combined arms exercises. The possible exception is

intelligence planning. Even though that CCF was a relative strength in the RC rotations, the IPB process was substantially higher in AC task forces. The other AC advantages in intelligence involved coordination: monitoring the execution of the reconnaissance and surveillance plan, reporting information (from lower echelons to the TF), and, especially, disseminating the information that had been collected. The advantages related to CCF 7 (Mortars) were especially pronounced for positioning, repositioning, and executing the fire support plan.

Relation Between RC CCF Ratings and METT-T Index

Sixteen offense missions were suitable for calculating the terrain score in the METT-T index. The elements of the index and the composite score were correlated with the CCF scores and the overall task mean for each suitable mission. The results of that analysis are shown in Table 5.

Table 5. Correlations of CCFs with METT-T and Elements

Critical Combat Function	METT-T	Blue Survive	OPFOR Destroy	Terrain
1. Intel Planning	.38	.25	.21	.41
2. Collect Information	.13	-.02	.09	.21
3. Process Information	-.01	-.01	-.18	.24
4. Disseminate Intel	.26	.18	.07	.37
5. Tactical Movement	.44*	.26	.11	.71***
6. Direct Fire & Mnvr	.51*	.57**	.31	.25
7. Mortars	.02	.13	-.19	.20
8. Field Artillery	.32	.28	.15	.30
15. FS Integration	.18	.19	.02	.20
16. Active AD Measures	.20	.16	.07	.26
18. Plan for Combat Ops	.14	.17	.01	.14
19. Direct & Lead: Prep.	.14	.24	.09	-.05
20. Direct & Lead: Execution	.07	.19	.13	-.23
21. Overcome Obstacles	.31	.11	.04	.62**
28. Transportation	-.04	.04	-.07	-.04
29. Supply	.30	.13	.28	.21

Critical Combat Function	METT-T	Blue Survive	OPFOR Destroy	Terrain
Mean of All Tasks	.32	.29	.10	.35
* Significance .05				
** Significance .01				
*** Significance .001				

While most CCFs exhibit modest relations with the METT-T index, only two correlate at generally accepted levels: Tactical movement and Engage enemy with direct fire and maneuver. These are the CCFs that would be expected to relate to a measure of battle outcome as shown by a sample of tasks in each CCF shown with their correlation to METT-T in Table 6.

Table 6. Tasks in CCF 5 and 6 with Strong Relation To METT-T

Battle Task	Correlation with METT-T
CCF 5: Tactical Movement	
Maintain security	.45
Move units to attack position	.40
Move units to assault position	.67
CCF 6: Engage Enemy with Direct Fire and Maneuver	
Assault the task force objective	.78
Support main effort	.83
Conduct actions at objective	.67
Consolidate forces on the objective	.87

The relation between the maneuver CCFs and the METT-T Index tends to confirm the construct validity of the CCF measures. While the measures are not completely independent (OCs were necessarily aware of battle results), the results do suggest that raters for the CCF measures were accurate in ascribing OC assessments to the appropriate tasks.

To assess the difference between CCF measures and a BOS measure, the correlation analysis was repeated with a BOS score composed of all tasks related to the maneuver BOS. That analysis showed a modest, non-significant relation (.34). The major difference between the two approaches was that the planning tasks related to maneuver were not included in the CCF

measures. A maneuver BOS measure based on only preparation and execution tasks correlated with the METT-T measure at a significant level comparable to the CCF correlations (.56).

Conclusions

The results of these analyses confirm the suitability of the procedures for converting OC comments to task assessments and using the resulting scores in quantitative analyses. Since OCs do not address task performance consistently, analysts should aggregate ratings to higher levels (such as BOS or CCF) before conducting any statistical analysis.

The CCF level of aggregation facilitates the interpretation of results, especially in identifying relative strengths and weaknesses. For example, the Maneuver BOS includes tasks related to Tactical movement and Engage enemy: direct fire and maneuver. An aggregation to the BOS level would have identified Maneuver as a relative weakness. The CCF aggregation, however, shows that Tactical movement is a relative strength, while the remedial attention should be focussed on Engage enemy: direct fire and maneuver.

The results of these analyses by themselves can be valuable aids for analysts who study NTC performance of ARNG units, since the sample includes all ARNG rotations with suitable data. However, converting OC comments to task assessments is labor intensive and only approximates the results that would be expected of direct assessment by OCs of task performance. Analysts who are interested in other subsets of future rotations would benefit from more systematic direct assessment of task performance, perhaps aided by electronic collection instruments.